

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1-64. (Cancelled)

65. **(Currently amended)** ~~The Josephson junction device of claim 59A~~
Josephson junction device, comprising:

a first layer comprising an oxide high-temperature superconductor;

a second layer comprising an oxide high-temperature superconductor; and

a third layer connecting the first and second layers and comprising a non-superconductor,

the first and third layers being formed from a starting oxide high-temperature superconductor layer of an oxide high-temperature superconductor, the third layer being an ion-modified portion of the starting oxide high-temperature superconductor layer, the first layer being an unmodified portion of the starting oxide high-temperature superconductor layer,

the device having an R_nA value of about 1×10^{-9} to about $3 \times 10^{-7} \Omega \cdot \text{cm}^2$ at 4.2 K.

66. **(Currently amended)** ~~The Josephson junction device of claim 65[2],~~
wherein the first layer comprises an YBCO superconducting oxide having an R_nA value of about 1×10^{-9} to about $3 \times 10^{-7} \Omega \cdot \text{cm}^2$ at 4.2K.

67. **(Currently amended)** ~~The device of claim 1~~ An electronic device comprising:

a crystalline substrate;

an electrode formed on and epitaxial to the substrate, the electrode comprising a first superconductive oxide;

a barrier comprising a non-superconducting, ion-modified surface layer of the first superconductive oxide; and

a counter-electrode formed directly on and epitaxial to the barrier, the counter-electrode comprising a second superconductive oxide, whereby a Josephson junction is formed between the electrode and the counter-electrode, having an $R_n A$ value of about 1×10^{-9} to about $3 \times 10^{-7} \Omega \cdot \text{cm}^2$ at 4.2 K.

68. **(Currently amended)** The device of claim 67, wherein the first and second superconductive oxides are YBCO having an $R_n A$ value of about 1×10^{-9} to about $3 \times 10^{-7} \Omega \cdot \text{cm}^2$ at 4.2 K.

69. **(Cancelled)**

70. **(Cancelled)**

71. **(Currently amended)** The Josephson junction device of claim 59A Josephson junction device, comprising:

a first layer comprising an oxide high-temperature superconductor;

a second layer comprising an oxide high-temperature superconductor; and

a third layer connecting the first and second layers and comprising a non-superconductor,

the first and third layers being formed from a starting oxide high-temperature superconductor layer of an oxide high-temperature superconductor, the third layer being an ion-modified portion of the starting oxide high-temperature superconductor layer, the first layer being an unmodified portion of the starting oxide high-temperature superconductor layer,

the device having a J_c value of about 1×10^3 to about $5 \times 10^6 \text{ A/cm}^2$ at 4.2 K.

72. **(Currently amended)** The Josephson junction device of claim 71 wherein the first layer comprises an YBCO superconducting oxide, having a J_c value of about 1×10^3 to about $5 \times 10^6 \text{ A/cm}^2$ at 4.2 K.

73. **(Currently amended)** The Josephson junction device of claim 1 ~~An~~
electronic device comprising:
a crystalline substrate;
an electrode formed on and epitaxial to the substrate, the electrode comprising a
first superconductive oxide;
a barrier comprising a non-superconducting, ion-modified surface layer of the
first superconductive oxide; and
a counter-electrode formed directly on and epitaxial to the barrier, the counter-
electrode comprising a second superconductive oxide, whereby a Josephson junction is
formed between the electrode and the counter-electrode,
the device having a J_c value of about 1×10^3 to about 5×10^6 A/cm² at 4.2 K.

74. **(Currently amended)** The Josephson junction device of claim ~~73~~[7],
wherein the first and second superconductive oxides are YBCO having a J_c value of about
 1×10^3 to about 5×10^6 A/cm² at 4.2 K.

75. **(New)** The Josephson junction device of claim 65, wherein the third layer
is substantially uniform.